NEWS

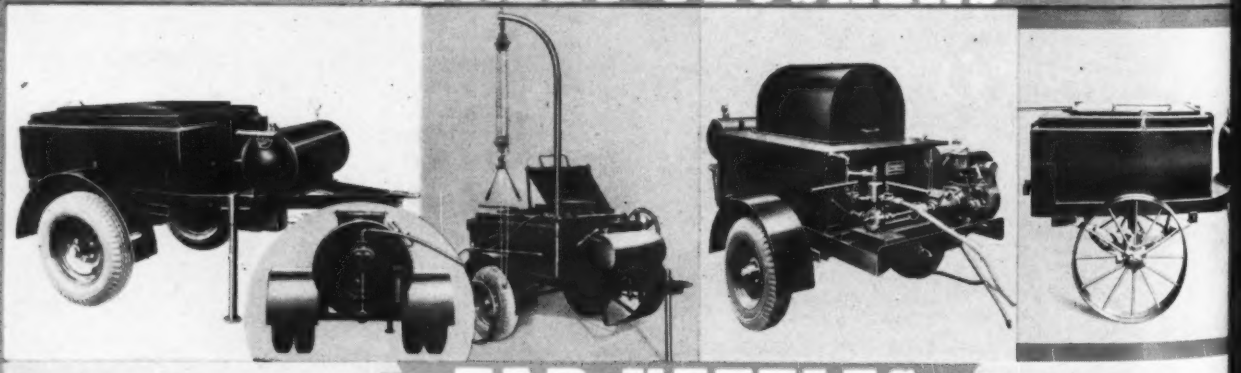
Pontoon detour around wrecked Rio Grande bridge – see p. 4.

STANDARD STEEL WORKS

PRESSURE DISTRIBUTORS

MAINTENANCE DISTRIBUTORS

STREET FLUSHERS



TAR KETTLES

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NORTH KANSAS CITY, MO., U.S.A.

ENGINEERING NEWS-RECORD

NEWS

Volume 124 JANUARY 25, 1940 Number 4

NOTES ON THE NEWS

Quick Surveys of Construction Events

▶ Comparisons between the contracts awarded in the first four weeks of this year and a corresponding period in 1939 are misleading unless it is realized that last year's high figures were the result of pressure from the PWA on communities to which it had allotted funds. Quick contracts were required if the towns were to get their money. A year ago the awards were 64 per cent ahead of 1938, which figure indicates that the general trend of construction still is upward, not downward as the short view would indicate. Of special significance is the fact that private work is up 12 per cent.

▶ Specialization is decried by engineers who discuss their profession abstractly, but it is all too evident at such meetings as that of the American Society of Civil Engineers last week. Only one session, the formal opening meeting, was without competition from a meeting of specialists.

▶ How to obtain a 23 per cent increase in clarification efficiency at sewage treatment plants simply by agitating the liquid with a paddlewheel was the astounding news given to the New York State Sewage Works Association last week. Engineers of The Dorr Co. who made public the results of a 3-year study of "pre-flocculation" thus pointed the way to what promises to be one of the most significant advances in treatment practice.

▶ Engineers can take satisfaction in the fact that about half the group now assembled in Washington to discuss the St. Lawrence Waterway Treaty is made up of engineers. Whether or not they approve of the project, they can find in this fact evidence of growing recognition of the value of engineering opinion on matters such as the St. Lawrence development.

American Society of Civil Engineers Extends Division Activities

New emphasis given to work of the technical divisions of the society at the annual meeting held in New York, Jan. 17–20

The growing importance of the technical divisions of the American Society of Civil Engineers was made evident at the annual meeting of the society held in New York, Jan. 17-20, through a reduction in the general meetings and an increase in the time given to concurrent meetings of the technical divisions. Also, the board of direction set up a new committee on technical divisions to coordinate the activities of the divisions and to keep their officers in closer touch with the board.

Honorary members

Honorary membership was conferred upon H. S. Crocker, consulting engineer, Denver; J. M. R. Fairbairn, retired chief engineer of the Canadian Pacific Ry.; Henry S. Jacoby, professor emeritus of bridge engineering, Cornell University, and T. U. Taylor, dean emeritus of engineering, University of Texas. The society medals and prizes were awarded as follows: The Norman Medal to Charles H. Lee, San Francisco; J. James R. Croes Medal to Prof. C. A. Mockmore, Oregon State College; James Laurie Prize to Stanley M. Dore, Boston; Arthur M. Wellington Prize to Rufus W. Putnam, Chicago; Collingwood Prize for juniors to Benjamin K. Hough, Jr., Binghampton; Rudolph Hering Medal to Albert J. Schafmayer and the late B. E. Grant, Chicago; Construction Engineering Prize, Howard L. King, New York.

George T. Seabury, secretary, reported that the membership had reached an all-time high of 16,000, and noted that junior members now make up 25 per cent of the total. Receipts for the year totalled $496,000 and expenditures $480,500 according to Otis E. Hovey, treasurer.

At the close of the opening session

(Continued on p. 6)

Federal Grand Jury Starts Probe of Missouri Work

A federal grand jury investigation of the $17,000,000 building program for eleemosynary and penal institutions in Missouri has begun, nine persons having been indicted on the charge of defrauding or attempting to defraud the United States Government in the handling of federal relief funds. For the work PWA and WPA supplied $7,000,000, and a state bond issue of $10,000,000 was voted in 1934. Construction started the following year.

Those indicted include: Charles A. Haskins, former chief engineer of the Bi-Partisan Advisory Board; L. Roy Bowen, St. Louis, supervising architect for the board; Ray Voskamp, Kansas City architect; George E. McIntyre, an engineer formerly with the American Aggregate Co., Kansas City; William D. Weidlein & Co., Kansas City, and Lee Riley, Jr., an engineer with the Kansas City Power & Light Co.

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Eugene, Ore. to Build Own Power Plant

Two years' efforts to negotiate a contract for Bonneville power with Eugene, Ore., southern terminus of the project's recently completed 123-mile Willamette Valley transmission line, failed last week when that municipality voted to construct an addition to its present plant. The final contract submitted by Paul J. Raver, administrator for the Bonneville project, at a meeting of the Eugene water board, was turned down by a board vote. Instead $510,000 will be spent for construction of a steam plant.

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Error Made in Reporting Fast Tunneling Record

In these pages last week was a report of 1,718 ft. of 18-ft. tunnel being driven through full-timbered hard ground in one month by Fred Stiefel, chief engineer for S. R. Rosoff, Ltd., on the Delaware River Aqueduct project for New York City. A typographical error attributed this particular record to Shaft 4, which was in error. Shaft 4 has some records of its own, as revealed by the last part of last week's story. Stiefel's timbered-ground record is associated with Shaft 3, and it's still a world record for this type of ground, as far as we know. At Shaft 4 Wm. Durkin is making fast time for Walsh Const. Co. in untimbered ground.

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Pennsylvania Turnpike Sued for Damages

A. D. Graham, president of the A. D. Graham Co., Somerset, Pa., has started suit against the Pennsylvania Turnpike Commission for $183,000 claimed as damages to the 11-miles right-of-way of the old Pittsburgh, Westmoreland and Somerset R.R., which is owned by the A. D. Graham Co.

• • •

Asphalt Supply Case Settled in Minnesota

The suit involving transactions between the Minnesota State Highway Department and the Okes Construction Co., St. Paul, has been settled, the company to pay $89,500. The case centers around the furnishing of 31,000 tons of patented asphaltic road surfacing material in 1936, 1937 and 1938, without the taking of competitive bids. Aggregate price of the material was $369,000 and the state sued for $140,000, claiming the transaction was illegal and the price exorbitant.

The company claimed it relied on highway department practices followed since 1921 and stressed that state attorney-generals and highway department attorneys had approved the practice. No fraud or misconduct on the part of the seller in securing or fulfilling the contract was charged.

• • •

Engineering and Mining Separated at Arizona Univ.

Regents of the University of Arizona have authorized separate colleges of mining and engineering, heretofore the two schools having been combined.

Henry Elected Head Of Consulting Group

Annual meeting hears Hotchkiss and Comfort on cultural education for engineers

Philip W. Henry was elected president and Ole Singstad vice president by the American Institute of Consulting Engineers at its annual meeting in New York Jan. 15-16. New members of the council are Frank A. Barbour, O. E. Hovey and Malcolm Pirnie.

At the annual dinner of the Institute, W. O. Hotchkiss, president of Rensselaer Polytechnic Institute, and W. W. Comfort, president of Haverford College, spoke on cultural elements in engineering education. Hotchkiss took the view that engineering education itself is an efficient preparation for life. He questioned the value of education through things alone or through people alone, and held that the two should be combined for proper cultural effect. Comfort argued for the study of Latin as a means of cultural education, emphasizing among other things its relation to modern languages.

N. Y. C. Dept. of Sanitation photo

SOMETHING NEW IN STREET FLUSHING—CHLORINATED RIVER WATER

COOPERATING in the water conservation campaign in New York City necessitated by reservoir shortages, the Department of Sanitation is flushing the city streets with water taken out of the Hudson River. Emergency pumping plants, using fire department equipment as well as portable gasoline pump units, have been installed at 40 points along the riverfront to service the street flushing trucks which require about 5,000,000 gallons a day.

To guard against possible health hazards from the sprinkling of sewage-polluted river water on the streets, the contents of each flusher are sterilized with chlorine. This is done by adding a solution of calcium hypochlorite to the tank trucks as they are being filled, in an amount sufficient to maintain a residual chlorine content of 20 to 25 parts per million.

This novel scheme was developed by Sanitation Commissioner William F. Carey and Health Commissioner John L. Rice.

Sewage Clarification Improvements Outlined at New York Sewage Works Meeting

Emerson tells state association that an independent national group may be formed; mechanical flocculation process and new chlorination equipment are described

A low-cost method of increasing clarification efficiency in sewage treatment processes simply by stirring the liquid prior to sedimentation, was described by engineers of the The Dorr Co., Inc., at the annual meeting of the New York State Sewage Works Association on Jan. 19. At the business meeting of the association, which is the largest state group devoted to the advancement of sewage disposal practices, Charles A. Emerson, chairman, Federation of Sewage Works Associations, announced that consideration is being given to formation of a strong national organization. This national body, he indicated, would probably be an independent entity and would not combine or consolidate with existing organizations in related fields of sanitary engineering.

A. J. Fischer and A. Hillman, research engineers of The Dorr Co., who reported the results of long-time laboratory and plant scale studies, stated that as much as 23 per cent increase in clarification efficiency was obtainable when sewage was agitated with a paddle-wheel mechanism so as to induce mechanical flocculation of suspended solids. Heretofore, the principal method of inducing and securing the advantages of flocculation was by the addition of chemicals, the cost of which is much higher per unit of solids removed than the mechanical system of agitation.

Fischer said that best results were obtained on raw sewage when it was flocculated for a period of 30 to 40 min., and then given a detention period of 1½ to 2 hr.; the paddle-wheel flocculators were most efficient when operated so that the peripheral speed was 1.4 fps. On trickling filter effluents satisfactory results were obtained with a 30-min. flocculation period, followed by a one-hour period of detention. It was reported that some 20 disposal plants in various parts of the country had already adopted mechanical preflocculation of raw sewage in their treatment processes.

This method of flocculation, said Harry W. Gehm, research chemist, New Jersey Agricultural Experiment Station, offers a challenge to chemical treatment methods. In order to compete, the latter will have to be improved to the point where they will offer practically complete removal of solids; high chemical costs at present make this procedure economically impossible.

Chlorination progress

New equipment designed to automatically feed chlorine in accordance with changes both in flow volume and sewage strength were described by A. E. Griffin, research engineer of Wallace & Tiernan Co. The system, known as "potential chlorination," makes use of an electrode cell through which a small amount of sewage is constantly passed. Changes in both volume and strength of sewage affect the potential on the electrodes in such a way as to vary the chlorine dose so that it will maintain a predetermined residual of chlorine.

Other papers in the technical session dealt with corrosion resistance of metals in sewage treatment plants (presented by G. L. Cox, International Nickel Co., Inc., and R. S. Burr, American Brass Co.) and regulation of stream pollution on the Raritan River in New Jersey (presented by L. Forman and R. E. Johns, New Jersey State Department of Health).

New officers

Elected to hold office in the New York State Sewage Works Association for the coming year were: C. G. Andersen, president; H. H. Wagenhals, vice-president; A. S. Bedell, secretary-treasurer; and J. T. Brigham, assistant treasurer. The secretary reported that the association has 669 members, a gain of 72 for the year.

The association, along with the sanitary section of the American Society of Civil Engineers, made an inspection tour of sewage disposal plants in the Raritan River Valley of New Jersey on Jan. 20. The plants visited were those located at Middlesex, New Brunswick and South River.

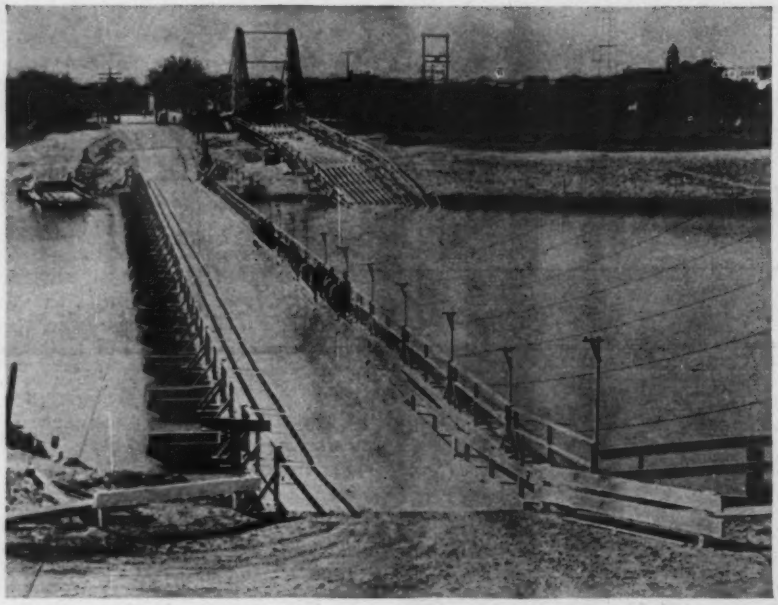
Wide World Photo

ENGINEERS PARTICIPATE IN ST. LAWRENCE WATERWAY STUDY

CANADIAN and American representatives are shown as they gathered in Washington, D. C., Jan. 22 to negotiate for a new treaty for the development of the St. Lawrence River and the Great Lakes Basin. Left to right around the table, they are: Oliver O. Lefebvre, engineer with the Departments of External Affairs and Resources in Canada; J. E. Read and Guy A. Lindsay, also of the Canadian Departments of External Affairs and Resources; O. D. Skelton, Under-Secretary of State in Canada for External Affairs; Loring C. Christie, Canadian Minister to the United States; T. H. Hogg, engineer and chairman of the Ontario Hydro-Electric Power Commission; M. C. Hendry, engineer with the Ontario Hydro Commission; Escott Reid, Second Secretary of the Canadian Legation; Gerald V. Cruise, engineer of the New York State Power Authority; Leland Olds, chairman of the Federal Power Commission; Adolf A. Berle, Assistant Secretary of State; John D. Hickerson, assistant chief of the European division of the State Department; Brig. Gen. T. M. Robbins, Asst. Chief of Engineers, U. S. Army, and Roger McWhorter, chief engineer of the Federal Power Commission. The current studies began in Ottawa, recently.

"Bridge Out" Pontoons to the Rescure

THE PROBLEM—a fallen suspension span, result of the failure of one of the cables over the Rio Grande at Hidalgo, Texas, (ENR Nov. 23, 1939, p. 672). The nearest bridge upstream is 52 mi. away and the nearest downstream is 30 mi., so the ferries which were pressed into service as soon as the accident occurred had a tough time satisfying the traffic needs at this important point. The view at the right is taken from the Mexican shore, and the one below was taken from the opposite bank.



THE SOLUTION—a temporary pontoon bridge. Engineers for the owners, the Valley Bridge Co., decided that the quickest way to duplicate service of the fallen bridge was to assemble a pontoon bridge alongside the wreckage. A week was required to assemble the materials, and in another two weeks the structure was opened to traffic. It is located so as to use, as far as is possible, the existing approaches and port of entry facilities.

Stiffening for the structure is provided through a system of wire ropes, a ¾-in. rope being stretched between plank deadmen on the two banks upstream, while smaller ropes lead from points on the catenary to the pontoons. These smaller ropes are visible in the illustration. A similar arrangement on the downstream side resists upstream winds.

TWENTY-THREE BOATS are used to support the Hidalgo pontoon bridge superstructure. Of these, nineteen are afloat at normal water level; the remaining four rest in pits dug on the Mexican bank, to provide for sudden rises of the river level. Pontoons were fabricated on the site. They are each 32 ft. long by 4 ft. 10 in. wide, and are 3 ft. 1⅝ in. deep. Joints are caulked and covered on the outside with asphalt. The superstructure provides 14 ft. of roadway and 4 ft. of sidewalk width. The pontoon bridge was designed for a 5-ton truck loading, and cost $8,000.

The Valley Bridge Co. will begin construction shortly on a new permanent crossing. The pontoon bridge was built by J. W. Beretta Engineers, Inc., San Antonio who are also designing the new bridge. A. M. Gault designed it and supervised preliminary work. J. O. Bishop supervised final installation.

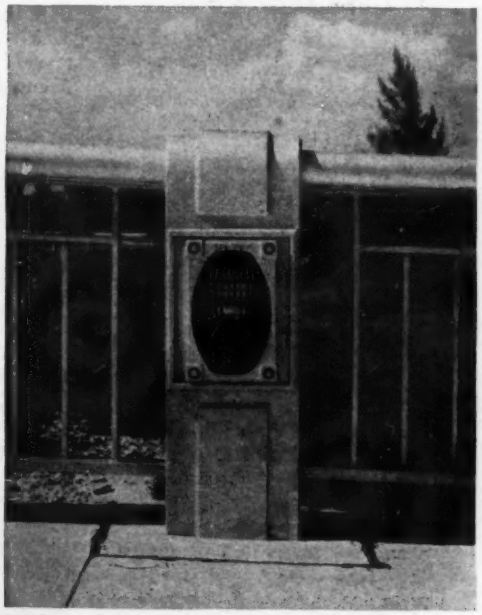
Miami Bascule Span Is South Florida's Largest

NEWEST AND LARGEST of the four score bridges that span the waterways in and about Miami is the new 27th Ave. Bridge which was opened late last year. Principal element of the project is a double-leaf trunnion type bascule span 148 ft. center to center of trunnions. The cost including landscaping was $365,000, 45 per cent of which was contributed by PWA.

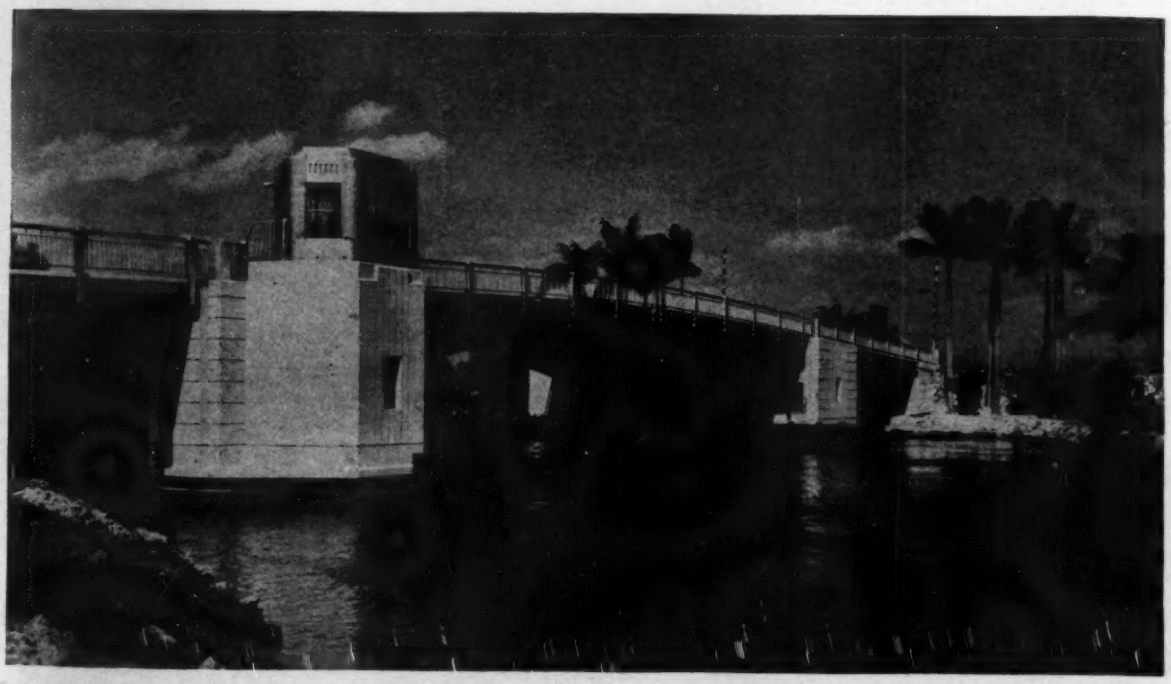
The Miami River at the bridge site is 15 ft. deep and is used extensively for river traffic. On account of a large amount of vehicular traffic at the site it was considered advisable to provide sufficient vertical clearance to permit most water traffic to pass under the bridge without making it necessary to raise it. The economical vertical clearance was determined to be 20 ft.

Because the bascule piers would have restricted the flow of water at the bridge site, it was necessary to provide additional waterway equivalent in area to the area of the piers; the excavated material was used in the roadway approach fills. Main piers of the bascule span are about 80 by 40 ft. in plan, and they extend 21 ft. below sea level and 23 ft. above. Each pier is supported by 279 untreated pine piles, driven to refusal through a porous limestone.

Harrington & Cortelyou were consulting engineers for the bascule bridge. The design of the approach spans, the approach fills and roadways and the supervision of the entire structure was in charge of the office of Edmund Friedman, county engineer. Chelsie J. Senerchia was project engineer, and A. B. Barnes, county park superintendent was responsible for the landscaping. Warren G. Young was resident engineer inspector for PWA. T. A. Loving & Co., Goldsboro, N. C. were the contractors for the construction of the bridge.



PARAPET TYPE LIGHTS were installed in the bridge railing at intervals of 50 ft. to illuminate the roadway and sidewalks. For the entire length of the bridge project the only projections above the railing are traffic gates, traffic signals and the control house. For this reason the bridge has an exceptionally clean cut appearance.



TOTAL LENGTH of the project is 978 ft. The 48-ft. roadway is flanked by two 6-ft. sidewalks. Royal and cocoanut palms used for landscaping the site suggest the tropics and tropical hurricanes which occasionally strike southern Florida. The bridge is designed to open against a 75-mi. wind. Regular power is provided by two 40-hp electric motors operated from the local electric lines, and an auxiliary motor-generator is on the job to care for emergencies. There is also provision for hand operation.

Engineers Meet

(Continued from p. 1)

the tellers reported the election of John P. Hogan, consulting engineer, New York, to be president for the year 1940. New vice-presidents are George L. Lucas, New York, and Joseph Jacobs, Seattle, and new directors are: E. P. Goodrich and Lazarus White, New York, Clarence M. Blair, New Haven, Clifford G. Dunnells, Pittsburgh, A. C. Polk, Birmingham, and Charles G. Hyde, Berkeley, Calif.

Extension of the grading and compensation schedule adopted by the board of direction at the San Francisco meeting in July, 1939, to include higher grades was authorized by the board at its meeting held in advance of the general meeting. The board also approved the elimination of the two-year practical experience requirement for those entering Grade 1 in the schedule. This change was made following strong objections to this requirement from engineers in the federal civil service.

Soil mechanics and foundations

Foundation problems presented by the deep river soil at the site of the Mississippi River bridge at New Orleans and by the marsh soil of Flushing Meadows on which the New York World's Fair was built were reviewed by Prof. W. P. Kimball, Dartmouth, and by George L. Freeman, George W. Glick and Hamilton Gray, New York, at the opening session of the soil mechanics and foundations division. Soil laboratory procedure in connection with the World's Fair was described by Prof. D. M. Burmister, Columbia.

Prof. Kimball reported that the New Orleans bridge piers go down as the river rises and rise as the river falls, by 1/200 ft. per foot of change in stage. No decrease in the movement has occurred in five years of service of the bridge.

Foundation design to control settlement of a building on clay was discussed in a paper by Prof. A. Casagrande, Harvard (see *ENR*, Nov. 23, 1939, p. 692, New England Mutual Life building, Boston). He stated that excavation of the 40 ft. of soil at the building site caused the exposed clay to swell 3 in. at the middle of the lot and 1⅜ in. at the corner, the former amount decreasing by 1¼ in. under the foundation weight, one-fourth the total load. Prof. Charles Terzaghi in another paper in this session discussed cases of settlement of ground near excavations, attributing the phenomenon to preplastic deformation of the soil from change in stress. An abstract of this paper will be published later.

In discussion, Carlton S. Proctor told of the settlement of the National Park Bank building, Fulton St., New York, during excavation of subway tunnels in the adjoining street, below foundation level. H. A. Mohr spoke of the difference between the contractor's and the engineer's measurements in cases of construction difficulty, and stated that measurements by an independent engineer are desirable.

Fatigue in structures

An unusual collection of cases of cracking or failure in steel railroad bridges was presented by B. R. Leffler, New York Central R.R. They ranged from the breaking of bolts in the bushings of bascule bridge bearings to cracking of notched-out web plates at

JOHN P. HOGAN
NEW AM. SOC. C.E. HEAD

the ends of floorbeams, longitudinal cracking at the root of top flange angles of stringers carrying tie floors, and cracking in floorbeam connections and posts due to cantilever pull of bottom laterals. Failures occurred generally after 20 to 40 years of service, and were attributed to fatigue resulting from stress concentration or overstress due to faults of design.

Recent European research and literature dealing with impact and fatigue were reviewed by F. H. Frankland, American Institute of Steel Construction. Improved knowledge of fatigue has been almost wholly due to welding development, he stated. European progress has closely paralleled that in the United States.

Rivets and riveted joints were reviewed by Jonathan Jones, Bethlehem Steel Co. Justifying the use of softer steel for rivets than for structural members he showed by test results that rivets increase 20 per cent in tensile strength due to driving. Shearing strength tests show that 45,000 lb. per sq. in. may be relied on as minimum, while special tests of single and two-rivet connections have shown that bearing strength exceeds 100,000 lb. per sq. in.; these values indicate that current specification figures for shear and bearing values are unduly low. However, care must be taken to provide sufficient end distance back of rivets.

As to fatigue, he pointed out that it is not a design factor for members whose dead load stress exceeds one-third the total, which applies to most members in the larger bridges. Where fatigue stresses govern, as in floor members and certain details, many of the advantages of using high-strength steel are lost because of their relatively low endurance strength.

Findings on flame cutting

What was intended to be a final report on flame cutting by the committee headed by Milton Male, U. S. Steel Corp., was converted into a progress report, as the committee is to continue work. General experience, he reported, shows that low carbon structural steels can be cut without harm to the adjacent material, while higher carbon and low alloy steels may develop a brittle zone unless special precautions are taken. The committee on fundamentals controlling structural design made a final report through A. V. Karpov, consulting engineer, and was discharged, its principal work being in the field of another committee.

Concrete design

Papers by Prof. Hardy Cross, Yale, on "Some Problems of Concrete Design", Prof. E. A. MacLean, Rose Polytechnic Institute, on "The Practice of State Highway Departments in the Design of Abutments", and Prof. N. M. Newmark, Illinois. "What Do We Know About Concrete Slabs?", represented concrete interest in the structural division. Prof. MacLean found large differences in the practice of different state highway departments; a brief abstract of his findings will be given in a later issue. Prof. Newmark presented a monumental review of analytical and experimental progress on the strength of slabs. Among the points he emphasized in summarizing were these: Slabs have more reserve strength than beams; at high loads the concrete tension is insignificant and in general the total amount of reinforcement determines the action of the slab; and when total moments are computed and their distribution is fixed by reasonable assumptions, "if reinforcement is everywhere provided for the theoretical moments, in general no more steel will

be required than is indicated by simplified calculations based on statical considerations only". In discussion Dean H. M. Westergaard, Harvard, and Prof. Harold Wessman, N.Y.U., emphasized the usefulness of the paper for simplification of codes.

The final report of the 10-year study of the committee on wind bracing in steel buildings was presented by Prof. C. R. Young, chairman. The important recommendations will be abstracted in next week's issue.

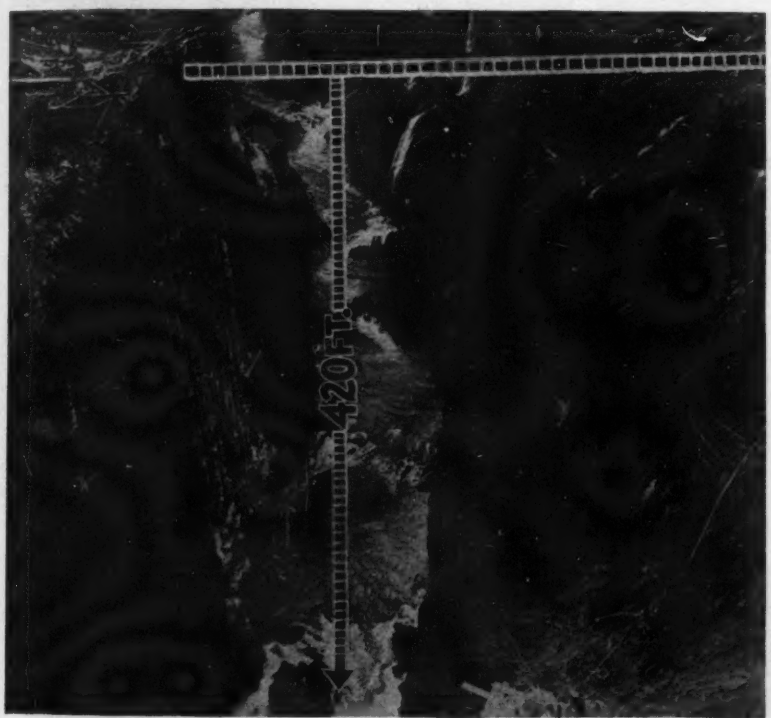
Power division

The future work of the Power Division was the subject of a round-table discussion at the division meeting. Proposals made to the chairman, William C. Creager, in reply to a circular letter from him had been segregated in advance of the meeting into several general headings and these were discussed separately. No effort was made to arrive at a conclusion on any subject, the purpose of the meeting being to give the executive committee a survey of opinions on which to base its findings for future meetings of the division and for committee work.

New York port developments

A well-planned series of papers before the waterways division covered the development and operation of the Port of New York. Col. C. L. Hall, district engineer at New York, outlined the inter-related duties of the various agencies interested in control and operation of the port and told where $112,000,000 had been invested in 45 main and many lesser channels in the harbor. J. A. Meehan, acting chief engineer, Department of Docks of New York City, explained the design and extent of the dock properties of the city, with some reference to North Beach Airport, constructed and operated by his department.

The Bayonne Terminal, a large quay-type terminal recently built on the Jersey side of New York Bay to give ocean shipping direct rail connection from the West, was described by Marcel Garsaud, consulting engineer, Jersey City. Glenn S. Reeves, engineer, port development, Port of New York Authority, discussed the present operations and future plans of that semi-public two-state organization. The sphere of influence of the Navy on the port was discussed by Rear-Admiral Ralph Whitman, New York, who explained the necessity for assured access to land bases. Emphasizing the importance of the airplane on transportation and the development of port facilities, Brehon B. Somervell, WPA Administrator at New York, outlined the construction and operation of land and seaplane facilities at the North Beach Airport. Somervell stated that construction costs on the airport were ten to fifteen per cent higher with WPA labor than they would have been under contract, but claimed that part of this was due to winter time relief work.



Seattle Post-Intelligencer Photo

DANGEROUS WORK AT MUD MOUNTAIN DAM

WORKING 300 ft. below the top of the canyon walls and 100 ft. above the swift-flowing river, workmen are here shown preparing the White River canyon near Enumclaw, Wash. for the $5,000,000 earthfill Mud Mountain Dam. Safety lines extending downward from the top of the canyon protect the workmen in case they slip. The photograph was taken looking upstream from a suspension bridge which the Guy F. Atkinson Co., general contractor, built across the canyon 450 ft. above the river. The dotted lines indicate the crest of the completed dam and the dam's height. The work is being done for the U. S. Engineers.

Highway division

At the highway division meeting Guy Kelcey, Signal Service Corp., Elizabeth, N. J., speaking on "Channelization of Motor Traffic," showed how quicker and safer movement of traffic is possible by the introduction of safety zones and "islands" to assure right angle intersections of the paths of traffic, thus causing the least concern to a driver as to what to expect from the other drivers. He illustrated numerous cases of how changes at intersections had increased the overall efficiency of the highway from 10 to 15 per cent to as much as 55 per cent and even higher, the efficiency being based on an average of 1,800 cars per lane per hour for a road free of intersections.

Thomas E. Stanton, Jr., materials and research engineer, California State Division of Highways, reported to the meeting on an investigation of the expansion of concrete as influenced by a chemical reaction between the type of cement and the type of aggregate. Details of this investigation of the California highway department are to be given in a subsequent issue.

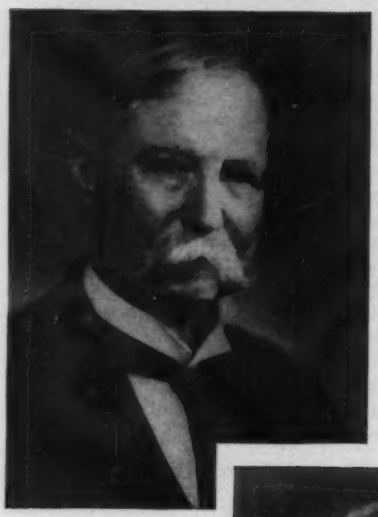
City planning division

The theme of the city planning meeting was "Community Planning Measures to be Undertaken During Neutrality as Part of a Preparedness Program." Justin R. Hartzog, city planning consultant of Cambridge, Mass., in discussing "Responsibility of the City Planner," stated that as yet city planning does not have the legal position in municipal activities that it should have if planning is to be effective.

"Public Housing and City Rebuilding" were discussed by Jacob L. Crane, Jr., consulting engineer, Chicago, and assistant administrator, U. S. Housing Authority, Washington, D. C. Three things Crane considers important in

(*Continued on p.* 12)

New Am. Soc. C. E. Honorary Members



T. U. Taylor (above)

H. S. Crocker (center)

J. M. R. Fairbairn (right)

William James Eames Binnie (above)

Henry Sylvester Jacoby (left)

THREE NATIONS are represented by the group of five men most recently chosen for honorary membership in the American Society of Civil Engineers. W. J. E. Binnie is from England, J. M. R. Fairbairn is a Canadian, and H. S. Crocker, H. S. Jacoby and T. U. Taylor are from the United States.

Thomas U. Taylor was dean of the school of engineering at the University of Texas from 1895, when it was formed, until 1936; since then he has held the title of dean emeritus. A native of Texas, he was graduated from the University of Virginia in 1883, and returned to his home state to teach in 1888. At 82, he holds office hours at 7 every morning and teaches an 8 o'clock class.

Herbert S. Crocker is a Denver consulting engineer and a past president of the Am. Soc. of C. E. He received his education at the University of Michigan and picked up years of varied engineering experience before settling in Denver. The Colfax-Laramer viaduct in Denver, one of the longest concrete viaducts in the world, was designed and built by him. During the war he was a lieutenant colonel in the engineers; in this capacity he built the army supply base in Brooklyn, N. Y., which included the largest single concrete building up to that time.

William J. E. Binnie was president of the Institution of Civil Engineers of London during 1939. After receiving a degree of M. A. from Trinity College, Cambridge, he entered active hydraulic, sanitary and hydroelectric practice in England, Central Europe and Africa. One of the outstanding jobs on which he was consultant was the second heightening of the Aswan Dam on the Nile River. Cancellation of the British-American Engineering Congress scheduled for last September deprived American engineers of the opportunity to meet Binnie and many other British engineers.

John M. R. Fairbairn has spent almost all of his career with the Canadian Pacific Ry. He studied engineering at the University of Toronto and entered service with the C.P. in 1892, working up to the position of chief engineer. He saw the line's trackage grow from 8,500 to 17,000 mi.; outstanding projects completed under his supervision include the Lethbridge viaduct, Lachine Bridge, Montreal and Quebec terminals, and some of the railroad's hotels. The Royal York in Toronto is the largest hotel in the British Empire.

Henry S. Jacoby, professor emeritus at Cornell Univ., was co-author of a famous book on structures back before the turn of the century. Text book writing and teaching have not been his only activities though; such diverse fields as professional engineering, religion and genealogy have attracted his thorough-going attention during the years. For 21 years he was a member of the executive committee of the New York State Council of Religious Education. Since his retirement from active teaching he has moved to Washington, D.C., where he is pursuing his family-tree studies in the genealogical records of the Library of Congress.

MEN AND JOBS

GEORGE DALIEGE, construction engineer of Columbus, Ohio, has been named senior engineer in charge of construction on the Federal Housing Authority project at Bradentown, Fla. Daliege for a time served as assistant superintendent of construction for Starrett & Co. at Columbus on the construction of several buildings. He also worked on the 950-unit federal housing project at Arlington, Va., and on Palmer House, Stevens Hotel and the Wrigley Building in Chicago.

VERN PARKS, superintendent of the new Lexington, Ohio, waterworks, has been re-named superintendent for a period of two years by the board of public affairs.

NORMAN E. DAVIS, WPA engineer for Warren County, N. Y., since 1937, has been appointed engineer in the Warren County highway department.

L. F. STOCK, district engineer for Regions 4 and 5 of the Farm Security Administration with headquarters at Raleigh, N. C., has been promoted to assistant chief engineer with headquarters in Washington, D. C. WILLIAM V. ALBRIGHT, assistant district engineer for Region 4 has been made district engineer of Region 5 with headquarters in Montgomery, Ala.; ROYAL KORNEGAY, former associate engineer for Region 4, has been appointed acting district engineer for that region and will make his headquarters at Raleigh.

ROGERS MYERS, who has been with the Mississippi State Highway Department as maintenance engineer in the northern district, has been made city engineer at Oxford, Miss. Myers will supervise construction of a sewage disposal system, a large amount of street work and a large sidewalk program.

L. V. BEAN, who was succeeded recently by E. D. HANAN as city manager of Paducah, Ky., is now employed in his old job as city manager of Waycross, Ga.

J. A. HADLEY has been appointed district engineer for the northern district at Houston for the Mississippi State Highway Commission. Other new appointments are: S. S. HOLDER, district engineer in charge of maintenance; H. E. Ford, assistant district engineer in charge of maintenance; and W. C. MATTHEWS, assistant maintenance engineer. T. C. ROBBINS, formerly northern district engineer, has been transferred to the southern district in the same capacity. HIRAM PATTERSON, Monticello, Miss., is the new chairman of the commission, and E. D. KENNA has been re-elected as director of the commission.

OSCAR BOWEN, a member of the engineering department of the Great Northern Ry. and stationed at St. Paul, recently retired from active duty after 38 years of service with the line.

ERNEST KITCHEN will serve as coordinator of the Great Lakes waterworks project being carried out at Toledo, Ohio, according to city manager GEORGE N. SCHOONMAKER. Kitchen is vice president of the H. C. Nutting Co. and has been stationed at Cleveland as resident engineer inspector for the PWA. Schoonmaker also announced that GEORGE LASKA, assistant engineer on the project, has been advanced to executive assistant to the supervising engineer.

CARL V. BERSTROM, former draftsman in the Milwaukee department of public works, is now acting as head of the WPA traffic survey in that city.

ROY B. PARKER, office engineer for the city engineering department at Oklahoma City, has resigned, effective Feb. 1, to enter the employ of the Kerlynn Oil Co., Oklahoma City. Parker has been connected with the city since his graduation from the University of Oklahoma in 1928.

RALPH A. MCDONALD, formerly resident engineer for PWA, has been appointed engineer for Maricopa County, Ariz.

CHARLES E. SLOAN, who has seived as assistant engineer of bridges for the Baltimore & Ohio R.R. since 1923, has been appointed engineer of bridges for the railroad with headquarters in Baltimore. Sloan, who holds engineering degrees from West Virginia and Johns Hopkins Universities, fills the vacancy caused by the recent death of P. G. Long, Jr. In 1911 Sloan entered the service of the Buckhannon & Northern R.R. Co. as draftsman and two years later joined the Baltimore & Ohio in the same capacity. With the B&O he was made chief bridge draftsman in 1918 and assistant engineer of bridges in 1923.

ALFRED WAHLBERG, engineer of Duluth, Minn., is head of a committee studying proposed changes in the building code for the city of Duluth.

Z. E. SEVISON, chief engineer of the North Dakota State Highway Department, G. E. Eldred, Public Roads Administration, and Walter J. Maddock, Minnesota state director of the Farm Security Administration, spoke at a meeting Jan. 10–11 of the County Commissioners Association of North Dakota. The meeting was held at Bismarck.

LT. WILFRED J. HOLMES is now assistant professor in the civil engineering department at the University of Hawaii, Honolulu, T. H. He is a graduate of the U. S. Naval Academy, class of 1922, and in 1929 received a Master of Science degree from Columbia University.

GILBERT D. FISH, consulting engineer on welded structures, will direct a course in welding design during the spring term at the Federation Technical School, New York City. Fish will be assisted by Robert Soman, field inspector and designer.

RALPH A. MACDONALD has been appointed engineer of Maricopa County, Ariz., to succeed D. M. DOWNEY. MacDonald, a graduate of the college of engineering at the University of Arizona, has been working as resident engineer for PWA.

JOSEPH H. ZIMMERMAN, for five years resident engineer for the Maryland Public Works Administration, is now resident engineer on Savage Dam which is being built five miles from Westernport on the Savage River. Zimmerman succeeds J. STANLEY TORBET, who resigned recently because of ill health. Zimmerman spent 3½ years in Baltimore County on construction of sewers, water mains, a disposal plant and a number of pumping stations. He obtained his engineering education at the Maryland Institute and Johns Hopkins University.

WALTER L. STAMBAUGH of Circleville, Ohio, has been appointed division superintendent of Division 6 for the Ohio State Highway Department. Stambaugh will be located at Delaware and will work under the direction of PERRY SHUMAKER, recently appointed engineer of the division. Stambaugh has been maintenance engineer in Pike County for several years.

EDWARD HYATT, engineer with the California Public Works Department, will direct the project studies and borings at the site of the proposed Rector Canyon Dam in Napa County, Calif. The dam is planned to provide water for several state institutions in the Napa Valley District.

MEETINGS

AMERICAN ROAD BUILDERS ASSOCIATION, Chicago, Jan. 29-Feb. 2.

NATIONAL PAVING BRICK ASSOCIATION, annual meeting, Congress Hotel, Chicago, Ill., Jan. 30-31.

AMERICAN TOLL BRIDGE ASSOCIATION, Atlantic City, N. J., Feb. 5–7.

ASSOCIATED GENERAL CONTRACTORS, National Convention, Peabody Hotel, Memphis, Tenn., Feb. 5-8.

NATIONAL SOCIETY OF PROFESSIONAL ENGINEERS, Columbus, Ohio, Feb. 8–10.

AMERICAN SOCIETY FOR TESTING MATERIALS, Hotel Statler, Detroit, Mich. March 4–8.

REGIONAL AND LOCAL

WYOMING ENGINEERING SOCIETY, 1940 Convention, Laramie, Wyoming, February 2-3.

AMERICAN WATER WORKS ASSOCIATION, New Jersey Section, winter meeting, Roger Smith Hotel, New Brunswick, N. J., Feb. 7.

OHIO SOCIETY FOR PROFESSIONAL ENGINEERS, annual convention, Columbus, Ohio, Feb. 8–10.

ASSOCIATION OF HIGHWAY OFFICIALS of North Atlantic States, annual convention, Hotel Ambassador, Atlantic City, Feb. 14–16.

MISSISSIPPI SOCIETY OF ENGINEERS, annual meeting, Jackson, Miss., Feb. 15–16.

WESTERN ASSOCIATION OF STATE HIGHWAY OFFICIALS, annual convention, Santa Fe, N. M., Feb. 16.

SOUTHWEST ROAD SHOW AND SCHOOL, Wichita, Kans., Feb. 20–23.

ONTARIO GOOD ROADS ASSOCIATION, annual meeting, Royal York Hotel, Toronto, Feb. 21-22.

IOWA ENGINEERING SOCIETY, annual convention, Ames, Feb. 22–23.

ARKANSAS ENGINEERS CLUB, annual meeting, Hotel Marion, Little Rock, Feb. 23-24.

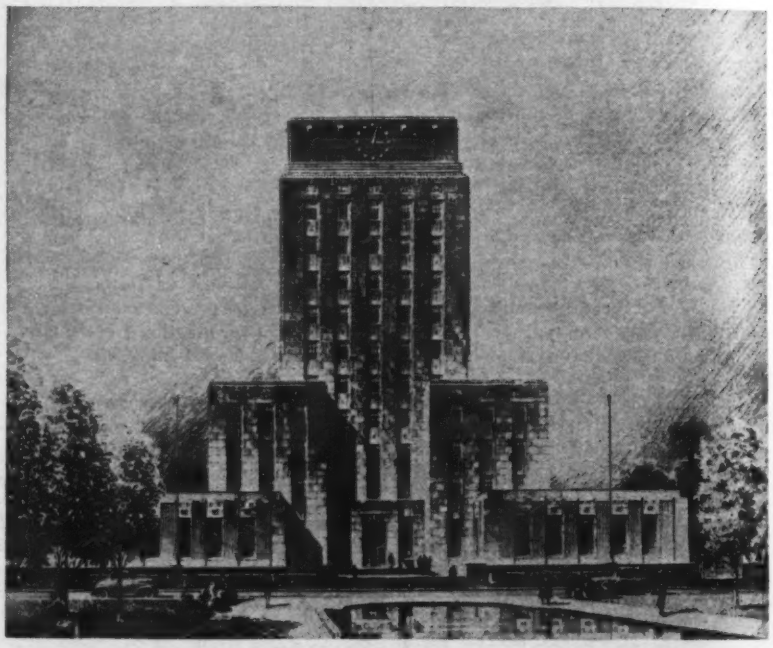
ELECTIONS AND ACTIVITIES

LORENZ STRAUB, professor of hydraulics at the University of Minnesota, last month discussed the experimental studies that are being made of the processes of sedimentation at the university's new hydraulics laboratory before the annual meeting of the Geological Society of America. Visiting geologists were also taken on a tour of inspection through the laboratory to view the various experimental studies.

THE ORGANIZATION of a Pacific Northwest Society of Engineers was discussed in Spokane, Wash., Jan. 13 at a banquet meeting of the North Idaho section of the Idaho State Society of Engineers and the Associated Engineers of Spokane. W. P. Hughes, city engineer of Lewiston, Idaho, served as toastmaster. G. A. Pehrson, president of the Spokane group, and J. M. Johnston, president of the North Idaho group and district engineer for the Idaho state highway bureau, were co-chairmen. Jesse Buchanan, dean of the college of engineering at the University of Idaho, was the speaker. Carl Smithwick was chairman.

ROY A. PALMER of the Duke Power Co. was installed as president of the Charlotte, N. C. Engineers Club, Jan. 11. Other new officers installed were: George O. Bason, vice president; W. B. White, secretary; and C. N. White, treasurer. New directors are H. H. Hill, C. B. Brown, M. G. Townend, E. W. Clark and W. W. Hanks. Principal speaker at the meeting was James F. Lincoln of Cleveland, Ohio, president of the James F. Lincoln Foundation.

AT THE 25th annual meeting of the Associated General Contractors of South Dakota, held last week at Huron, S. D., Henry H. Hackett, Rapid City, was re-elected president, R. A. Mark, Brookings, vice president, and L. F. Boyce, Sioux Falls, secretary. To succeed Henry Carlson, H. W. Claus, Sioux Falls, was elected treasurer. C. E. Carlson, Sioux Falls and Roy Rose, Watertown, were elected to succeed I. N. Douglas, Aberdeen, and John Giese, Mitchell, as directors for the coming year.



CITY HALL BUILT AS HOUSTON SETS CONSTRUCTION PACE

IN KEEPING with being the most active city in the building field last year for cities below 400,000 population, Houston, Tex., has placed under construction a 10-story Municipal Building, which when completed this year at a cost of $1,700,000 will be very similar to the structure shown above. Thomas Bates & Son, Denver, Colo., are the general contractors. D. M. Duller, Houston, is serving as engineer, and J. Finger, Inc., Houston, as architect.

Houston building permits for the first eleven months of 1939 totaled $24,620,000 as compared to $23,477,000 for the corresponding period of 1938. Miami, Fla., having issued $15,400,000 worth of building permits for the eleven-month period, ranked second.

Other structures under construction in Houston include a $1,350,000 addition to the Chamber of Commerce Building, a 9-story addition to the Humble Oil Building costing $1,250,000, the Gas and Oil Building, an administrative building and hangars at the Houston airport, and a block-square building for Sears Roebuck & Co.

OBITUARY

W. C. CUSHING, 77, who served 44 years with the Pennsylvania R.R. before retiring in May 1932, died Jan. 11 at Philadelphia, Pa. Cushing was best known for his work in the American Railway Engineering Association, of which he was a past president and honorary member. In 1903 he was made chief engineer of maintenance of way on Pennsylvania lines west and in 1920 appointed engineer of standards on the staff of the chief engineer at Philadelphia.

HOWARD S. WRIGHT, founder of the Seattle construction firm of Howard S. Wright & Co., died Jan. 12 at Everett, Wash. Wright had been engaged in the construction industry in Washington from 1888 until his retirement twelve years ago.

ROBERT J. THOMAS, 84, water works engineer and former president of the New England Water Works Association, died Jan. 10. For 30 years Thomas was superintendent of the Water Works Department at Lowell, Mass.

JAMES L. WARREN, ret'red civil engineer, died Jan. 16 at White Plains, N. Y. at the age of 91. Warren served as water commissioner and superintendent of streets for the old village of White Plains.

SAMUEL A. STERRETT, 62, engineer for the borough of Mars, Pa., died Jan. 19. Sterrett, a graduate of Geneva College, had served as engineer at Mars for the past eight years. He had also done civil engineering work in Venezuela for a number of years.

JOHN C. WHEELON, 87, reclamation and agricultural engineer and chief engineer of Utah-Idaho Sugar Co., of Garland, Utah for a time, died in Salt Lake City, Jan. 15. For a time Wheelon toured the intermountain area for Utah State Agricultural College, giving lectures and demonstrations in irrigation and agricultural engineering.

EDMUND M. HOROWICZ, 28, engineer of Allegheny County, Pa. died in Pittsburgh Jan. 16. Horowicz, a graduate of Pittsburgh University, had worked for Potter McCunne previous to his county job.

P. A. LANDRY, district highway engineer at Rexton, N. B. died this month. Landry was a graduate of St. Joseph's University, St. Joseph's, N. B. and McGill University, Montreal.

Other recent deaths include: ROBERT J. LLOYD, 79, retired contractor and builder and for 17 years superintendent of shops and repairs for the board of education at St. Louis; VINCENT P. DRUGAN, 65, general manager of the John McShain building concern of Baltimore; FRED J. DAUES, 69, former president of the Mason Contractors Association at St. Louis; WILLIAM J. MCCULLY, former St. Louis contractor, Nashville, Tenn.; F. H. TIDMAN, 82, pioneer in the public utility industry, Oklahoma City; ADOLPH BERGDAHL, 66, for many years a building contractor in Minneapolis, Falls Village, Conn.; N. H. SHEPPARD, 71, South Dakota builder at Pierre; JOHN NICHOLS, 85, construction engineer who aided in building the water works plant at Pineville and Georgetown, Lexington, Ky.; THADEUS B. ROBINSON, architect and contractor who built Fort Ethan Allen at Vermont, Pittsfield, Mass.; IVAN B. MCCORKLE, director of research laboratory of the National Tube Co., Pittsburgh; PAUL E. CHALIFOUX, 59, graduate of Massachusetts Institute of Technology and part owner of the Kirkpatrick Sand & Cement Co., Birmingham; JOHN CURE, 79, former maintenance superintendent for the West Shore R.R., Kingston, N. Y.; CARL G. SWANSON, 57, engineer with the Pinal County, Ariz. highways department, Florence, Ariz.; THOMAS F. ADAMS, 80, general contractor, Richmond, Va., and WILLIAM M. REMINGTON, 62, who retired in 1938 after seven years as engineer of the city planning board at Springfield, Mass.

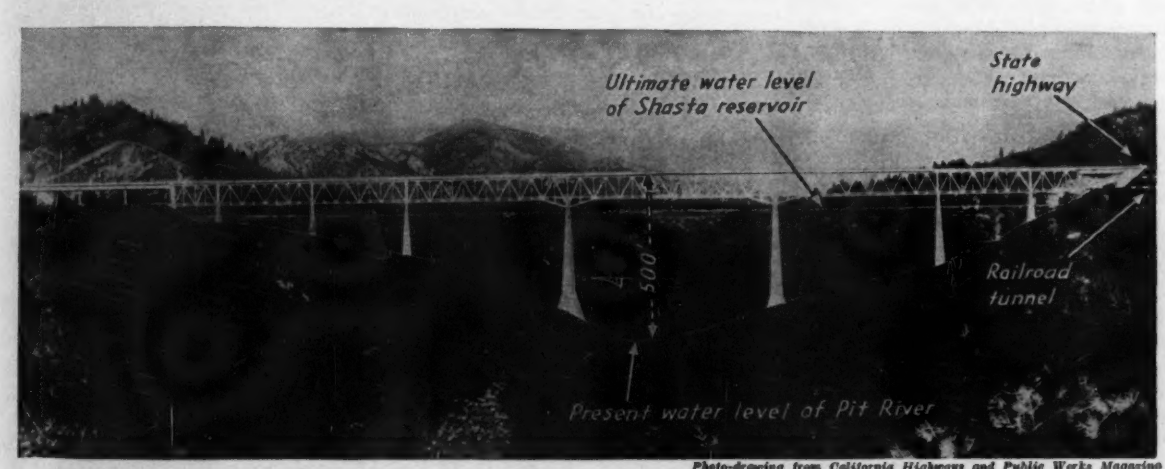


Photo-drawing from California Highways and Public Works Magazine

WORLD'S TALLEST PIERS WILL CARRY BRIDGE FAR ABOVE PIT RIVER VALLEY

THE COMBINED railroad and highway bridge that will cross the Pit River arm of Shasta Reservoir above high water level is a $5,000,000 undertaking on which the first contract ($1,138,388 for piers and abutments) was recently awarded to Union Paving, San Francisco. Low bidder on the superstructure is American Bridge at $2,588,000.

The lower bridge deck will carry two railroad tracks for the Southern Pacific's main line and on the upper deck, more than 530 ft. above streambed, will be a 44-ft. roadway flanked by two 2½-ft. sidewalks to take care of traffic on U. S. Highway No. 99.

The central span, a cantilever truss, is to be 630-ft. long. There also will be two 497-ft., three 282-ft. and two 141-ft. deck truss spans. The girder spans will include one of 150-ft. and four of 141-ft. length. Two of the piers will exceed a height of 350 ft.; the tallest will be 358 ft. high with a 95x 90-ft. base. The three largest piers are to be cooled during curing by water circulation systems. The bridge project involves 276,000 cu. yd. of excavation and 95,000 cu. yd. of concrete.

Title to the bridge will remain with the U. S. government but California is to have a perpetual easement for highway uses and maintenance.

Am. Soc. C.E. Meeting

(Continued from p. 7)

the study of future city development are: (1) whether cities will spread out more or will continue to be the high concentration of today, (2) use values of land and (3) what orders of housing and what densities shall we plan for.

E. P. Goodrich, consulting engineer, New York, discussed "Transport and Traffic Problems in Metropolitan Areas" as related to preparedness.

Sanitary engineering division

Problems of sewage disposal in the New York metropolitan area and the progress made in pollution abatement, occupied the major attention of the sanitary engineering division. Among the committee reports, the one on water supply engineering, featuring a 10-year review of progress was hailed as an outstanding contribution to reference literature. It was read in part by Thomas H. Wiggin, consulting engineer, New York, and chairman of the committee.

Factual evidence of the advance in pollution abatement in the Interstate Sanitation Commission district (covering New York harbor and contiguous waterways of New York, New Jersey and Connecticut), were cited by Seth G. Hess, chief engineer of the commission, who reported that 53 sewage disposal plants are now in operation and 17 more are under construction. A decade ago, only 35 plants were treating sewage, and of these 10 consisted merely of screening units.

Additional cost $200,000,000

If the present rate of construction is maintained, Hess stated, the program will overtake current requirements within ten years. The cost for additional treatment work is estimated to be over $200,000,000.

Sewage pollution abatement in the metropolitan areas west of the Hudson River is an exceedingly intricate problem because of the patchwork of political units in the thickly populated sections of northern New Jersey, according to C. J. Velz, professor of sanitary engineering, Manhattan College. Along the Hudson River in a distance slightly greater than the length of Manhattan Island, two counties and twelve municipalities are encountered. While the expense and lack of efficiency associated with a treatment plan for each political unit is obvious, the difficulties of developing a completely coordinated plan seem insurmountable, Velz said.

In Nassau County on Long Island, a rapidly developing surburban home area with a population of 400,000, only 25 per cent of the people are served by municipal sewerage systems, the balance depending on cesspools and similar devices. This is a special problem in sewage disposal, said James L. Barron, director, division of sanitation, Nassau County Department of Health, who reported that a $15,000,000 program of sewer and treatment plant construction was planned looking toward the elimination of about 100,000 cesspools. However, since the cesspool effluents are believed to contribute materially to the groundwater recharge in the sandy soil of the county, plans for central disposal work will probably include provision for returning the treated effluent to the ground. Storm-water in certain areas, stated Barron, is already being used to recharge the groundwater supply.

How New York City is pushing its program of sewage disposal was revealed by Richard H. Gould, deputy commissioner, Department of Public Works, who reported that $41,000,000 had been expended for new works. To complete the program $148,000,000 will be required. The biggest problem with which New York is faced, is to finance this program for which there should be an income which would preferably be derived outside of that obtained from real estate taxation.

CONTRACTS AND CAPITAL

ENGINEERING construction awards for the week total $32,678,000, a decrease of 21 per cent from the volume for a week ago, and 34 per cent below the total for the corresponding week last year.

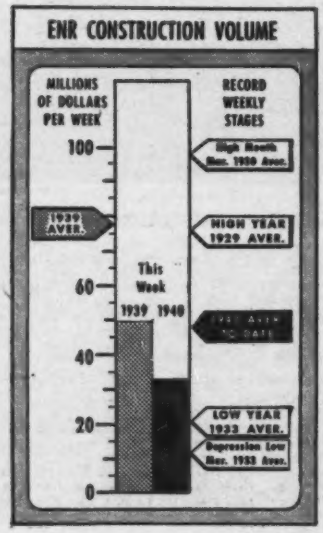
The current week's awards bring engineering construction to $191,977,000 for the four weeks of 1940. This is 38 per cent lower than in the initial 4-week period last year. Private awards for the period, however, are 12 per cent higher than a year ago.

Private awards for the week are 16 per cent below last week and 32 per cent under last year. Public construction is 23 and 35 per cent lower, respectively, than a week ago and a year ago.

In the classified construction groups gains over last week are reported in waterworks, earthwork and drainage, and unclassified construction. Unclassified is the only class of work to record an increase over the 1939 week.

New capital for construction purposes for the week totals $4,975,000, a decrease of 58 per cent from the volume for the corresponding 1939 week. The current week's total is made up of $4,453,000 in state and municipal bonds, $464,000 in corporate security issues, and $58,000 in RFC loans for public improvements.

New construction financing for the year to date, $73,908,000, is 6 per cent higher than the $69,550,000 reported for the 4-week period in 1939.



CONTRACTS

(Thousands of dollars)

	Week Ending Jan. 26 1939	Jan. 18 1940	Jan. 25 1940
Federal	$3,978	$3,169	$5,385
State & Municipal	32,137	27,440	18,151
Total public...	$36,115	$30,609	$23,536
Total private..	13,368	10,852	9,142
TOTALS	$49,483	$41,461	$32,678
Cumulative 1940 .....(4 weeks).....			$191,977
1939 .....(4 weeks).....			$311,693

Note: Minimum size projects included are: Waterworks and waterways projects, $15,000; other public works, $25,000; industrial building, $40,000; other buildings, $150,000.

NEW PRODUCTIVE CAPITAL

	Cumulative 1939 4 Wks.	1940 4 Wks.
NON-FEDERAL ...	$69,550	$73,908
Corp. securities..	18,645	10,318
State & Mun....	42,867	18,333
R.E.A. loans.....	8,038	....
U.S.H.A. loans...	....	45,199
R.F.C. loans.....	....	58
FEDERAL	$....	$....
TOTAL CAPITAL..	$69,550	$73,908

FHA MORTGAGES

	Week Ending Jan. 21 1939	Jan. 13 1940	Jan. 20 1940
Selected for appraisal	$18,412	$15,244	$15,009*
Cumulative 1940 .....(3 weeks).....			$44,397*
1939 .....(3 weeks).....			$48,839

* Subject to revision.

ENR INDEX NUMBERS

Index Base = 100		1913	1926
Construction Cost	Jan., '40	238.34	114.57
Building Cost	Jan., '40	201.52	108.94
Volume	Dec., '39	172	75

CONTRACT UNIT PRICES

What contractors are bidding on different kinds of construction work

INDIAN ROCK DAM PENNSYLVANIA

OWNER: U. S. Engineer Office, Baltimore, Md. Col. W. A. Johnson, district engineer.

PROJECT: Construction of Indian Rock Dam on main branch of Codorus Creek, near junction of Main and South Branches, about 3 miles southwest of York, Pa. Rolled earth and rock fill outer shell. At top elevation dam will be 1,000-ft. long. Height above valley terrace 75 ft.; height above stream bed 80 ft. Top width 29 ft.; road across top. Embankment consists of select impervious core with adjacent transition sections and upstream and downstream rock shells. Core trench to be excavated to firm rock. Outlet works to be located in right abutment consist of circular tunnel, concrete intake structure, trash racks and gates at upper end and stilling basin at lower end. Spillway channel 750-ft. long varies in width from 30 to 50 ft.

CONDITIONS: Contractor to furnish all materials and complete project in 763 calendar days. Railroad facilities available to within 1½ miles of dam site. Two secondary highways also available for transportation. Wage rates on project are: skilled, 80c. to $1.25 per hr.; semi-skilled, 60 to 75c.; and common, 50 to 60c. per hr.

BIDS: Fifteen bids were received December 22, 1939, ranging from the contract low of $1,206,104 to $1,964,415.

LOW BIDDERS:

1. Benjamin Foster Co., Philadelphia, Pa... $1,206,104
2. Booth & Flinn Co., Pittsburgh, Pa..... 1,208,881
3. Ralph Myers & Chas. H. Tompkins Co., Washington, D. C..... 1,223,414

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Diversion and care of stream	L.S.	$2,300.00	$6,000.00	$18,000.00
2. Remove existing structures	L.S.	600.00	500.00	900.00
3. Clean reservoir area, bel. El. 435.	L.S.	2,000.00	3,000.00	5,880.00
4. Clean and grub dam site	10 ac	470.00	500.00	150.00
5. Common stripping, embankm't.	12,500 c. y.	.33	.75	.34
6. Rock stripping, embankment	500 c. y.	4.70	4.00	4.00
7. Common excavation	150,000 c. y.	.40	.50	.28
8. Excav., borrow areas A, B, inc. haul	200,000 c. y.	.20	.30	.28
9. Rock excavation, spillway	158,000 c. y.	1.44	.95	1.35
10. Rock excav., tunnel intake, outlet, etc.	20,000 c. y.	2.35	1.50	1.20
11. Rock excav., core trench	1,800 c. y.	3.00	2.00	2.00
12. Rock excavation, trenches	330 c. y.	5.30	12.00	10.00
13. Line drill and broach	37,000 s. f.	1.04	1.85	1.50
14. Struct. backfill compacted	1,500 c. y.	1.00	3.50	.50
15. Struct. backfill, uncompacted	1,900 c. y.	.65	1.50	.30
16. Tunnel excavation	4,500 c. y.	16.70	8.00	9.50
17. Timbering in tunnel	45 Mbm	130.00	50.00	55.00
18. Select imperv. fill, embank	210,000 c. y.	.15	.10	.08
19. Impervious fill, embankment	80,000 c. y.	.15	.10	.08
20. Roll, add'l. three trips	50,000 sq.	.03	.02	.01
21. Rockfill, embank., toe trench, slopes	190,000 c. y.	.17	.23	.10
22. Rock spalls, embank., stream slopes	27,000 c. y.	.26	.28	.70
23. Sand, gravel filters and drains	1,700 c. y.	.90	.70	1.50
24. Rock paving in gutters	400 s. y.	1.00	5.00	1.50
25. Cr. stone surf., access roads	9,000 s. y.	.80	1.00	.65
26. Spalls, rockbase in rdwy	2,000 c. y.	2.50	.60	.70
27. Drill holes, rock or conc	17,000 l. f.	.66	.50	.60
28. Core drill for press. grout	6,000 l. f.	2.00	2.25	2.00
29. Rotary or percus. drill, grout	2,400 l. f.	2.00	1.00	1.40
30. Pressure grouting	8,000 c. f.	1.30	1.70	1.00
31. Pneum. cement wk. or gunite	5,000 c. f.	1.00	.80	1.15
32. Reinforcing steel	736,000 lb.	.05	.045	.047
33. 4-in. tile drain	9,000 l. f.	1.00	1.00	1.00
34. 10-in. tile drain	950 l. f.	1.50	1.30	1.25
35. 12-in. tile drain	680 l. f.	1.65	1.50	1.35
36. Conc., intake weir, ret. walls	12,650 c. y.	9.65	11.00	11.40
37. Conc., spillway chan. lining, etc., side slopes	5,500 c. y.	10.00	15.00	16.60
38. Conc., spillway chan. lining, etc., floor	5,100 c. y.	8.00	10.00	10.50
39. Conc., intake struct., operat. hse	6,000 c. y.	14.50	12.50	13.20
40. Concrete in tunnel lining	1,300 c. y.	24.25	15.00	18.90
41. Conc., core tr., slab of weir, etc.	650 c. y.	9.30	9.00	9.00
42. Service gate, hoisting equip., cond. lining	L.S.	50,000.00	75,000.00	70,000.00
43. Emergency gates, accessories	L.S.	10,000.00	20,000.00	19,500.00
44. Power and lighting system	L.S.	5,000.00	6,000.00	12,500.00
45. Copper water stops	300 lb.	.65	.60	.63
46. Traveling crane and hoist	L.S.	4,042.00	6,000.00	5,700.00
47. Struct. steel, bridge and misc.	167,000 lb.	.08	.08	.072
48. Misc. metalwork	14,000 lb.	.20	.20	.24
49. Black steel pipe	3,300 lb.	.10	.10	.19
50. Wrought iron pipe	6,300 lb.	.13	.15	.126
51. 12-in. corr. met. pipe	32 l. f.	2.65	2.00	2.17
52. 18-in. corr. met. pipe	32 l. f.	4.00	3.00	3.06
53. 24-in. corr. met. pipe	70 l. f.	5.30	4.00	3.60
54. Highway guard rail	4,200 l. f.	1.20	.90	1.10
55. Steel pipe fencing	250 l. f.	2.00	1.00	1.68
56. Fencing, spillway and property	6,000 l. f.	1.40	.60	.92
57. Operating house, superstr.	L.S.	15,230.00	18,000.00	18,350.00
58. Lumber for bridge	12 Mbm	170.00	120.00	126.00
59. Stiff-leg derrick	L.S.	5,600.00	7,000.00	7,800.00
60. Power transmission line	L.S.	2,180.00	800.00	720.00
61. Garage and comfort station	L.S.	4,356.00	5,000.00	5,280.00
62. Engineer field office	L.S.	2,180.00	3,000.00	4,160.00
63. Operator's house, complete	L.S.	10,263.00	14,000.00	18,480.00
64. 6-in. vit. pipe sew. and manholes.	260 l. f.	5.30	4.00	2.85
65. Septic tank and filter	L.S.	1,226.00	1,800.00	1,980.00
66. Pump and accessories	L.S.	500.00	500.00	413.00
67. Drill well, max. depth 100 ft.	100 l. f.	3.60	3.00	3.78
68. Drill well, over 100 ft. deep	120 l. f.	4.00	3.25	3.78
69. Case well, max. depth 55 ft.	55 l.f.	2.60	2.00	1.26
70. Surface dressing and seeding	1,100 sq.	1.60	5.00	.75
71. Enameled steel gages	120 l. f.	6.00	1.30	1.89

GRADE SEPARATION INDIANA

OWNER: Indiana State Highway Commission, T. A. Dicus, Chairman, Indianapolis, Ind. M. R. Keefe, engineer.

PROJECT: Grade separation over Pennsylvania Railroad at Road 6, Hobart, Lake County, Indiana. Involves construction of four reinforced concrete girder spans, each 36-ft.; continuous steel beams, two spans 50-ft. 7-in., and one 60¾-ft.

CONDITIONS: Rail and highway facilities available. Materials to be furnished by contractor. Project to be completed by Oct. 1, 1941. Wages are: skilled, 75c. per hr.; semi-skilled, 60c.; and common labor, 50c. per hr.

BIDS: Four bids were received June 16, 1939, ranging from contract low of $137,630 to $154,681. Awarded Nov. 4.

LOW BIDDERS:

1. Powers-Thompson Constr. Co., Joliet, Ill..... $137,630
2. J. C. O'Connor & Son, Fort Wayne, Ind..... 141,927
3. Reith-Riley Co., Goshen, Ind..... 150,562

Item	Quan.	Unit Prices (1)	(2)	(3)
1. Class D concrete	895.2 c. y.	$29.50	$33.00	$31.00
2. Class E concrete	189.2 c. y.	15.00	20.00	22.00
3. Handrail	655 l. f.	5.00	4.00	5.00
4. Foundation excav. (unel.)	623 c. y.	2.50	1.50	2.50
5. Common excav.	1,982 c. y.	.50	.75	.40
6. Special borrow	64,877 c. y.	.45	.46	.45
7. Spec. filling material	10,332 c. y.	.45	.46	.45
8. Structural steel	181,781 lb.	.056	.058	.065
9. Reinforcing steel	205,558 lb.	.045	.042	.055
10. Cast iron	316 lb.	.12	.12	.15
11. Rein. conc. pavement	8,850 c. y.	2.75	2.50	2.50
12. Pav. expan. joint, type D	600 l. f.	.40	.50	.90
13. Flex. steel plate guard rail	2,636 l. f.	1.00	1.25	1.50
14. Top soil	23,420 s. y.	.25	.15	.40
15. Sodding	23,420 s. y.	.25	.25	.30
16. Remove paving	5,290 s. y.	.40	.40	.30
17. Remove sidewalk	70 s. y.	1.00	.40	.30
18. Finish shoulders and ditches	3,448 l. f.	.20	.25	.30
19. Concrete sidewalk	70 s. y.	2.00	2.50	3.00
20. Integral curb walk	25 s. y.	3.00	2.60	3.50
21. Standard lip gutter	2,589 l. f.	.80	1.00	1.25
22. Special lip gutter	73 l. f.	1.00	3.00	2.00
23. Comb. curb and gutter	500 l. f.	1.00	1.50	1.80
24. Std. curb inlet, types D, C	7 ea.	50.00	175.00	60.00
25. Spec. curb. inlet, types D, C	1 ea.	75.00	200.00	75.00
26. Thickened rein. conc. pavement	175 s. y.	3.50	4.00	3.50
27. Pavmt. constr. joints, type D	1,168 l. f.	.30	.40	.65
28. 6-in. dbl. roll copper gutter	40.6 l. f.	1.50	1.50	3.00
29. 6-in. gutter circles	12 ea.	1.00	1.50	2.50
30. Peat removal	200 c. y.	.50	.50	.50
31. Bitum. stabilized mixture	499 ton	3.50	8.00	4.50
32. Remove pipe and manhole	L. S.	250.00	25.00	150.00
33. Aggregate, sub-surf. drains	24 s. y.	3.00	4.50	3.00
34. 1-in. cork, rubber or fiber expan. joints	134 l. f.	.50	.35	1.00
35. Pref. bitum. expan. joints (1-in.)	112 l. f.	.50	.35	1.00
36. Pref. bitum. coated corr pipe (6-in.)	132 l. f.	1.00	1.25	1.30
37. 12-in. V.C.; R.C.; C.I.; or conc. pipe	66 l. f.	1.25	1.30	1.50
38. 15-in. V.C.; R.C.; C.I.; or conc. pipe	166 l. f.	1.50	1.50	1.80
39. 12-in. corr. met. pipe	200 l. f.	1.25	1.25	1.50
40. 15-in. corr. met. pipe	16 l. f.	1.50	1.50	2.00
41. Bridge barriers	2 ea.	25.00	25.00	30.00

CONSTRUCTION REPORTS

Compiled by BUSINESS NEWS DEPARTMENT
Engineering News-Record, 330 W. 42nd St., New York
ELSIE EAVES, MANAGER
(Daily service also available—Write for details)

Projects—By Size

Construction projects here reported cover the United States and Canada, are of these minimum sizes or larger: water supply, earthwork, waterworks, $15,000; other public works, $25,000; industrial buildings, $40,000; other buildings, $150,000.

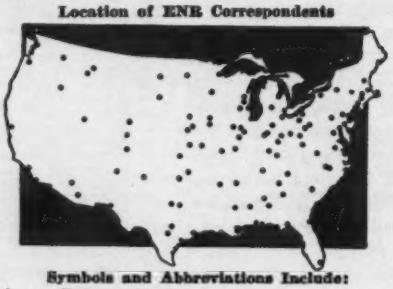
Classes of Construction
(Named in order of Listing)

Water Supply	Unclassified
Sewers, Waste Disposal	Materials, Equipment
Bridges, Grade Cross'gs	Public Buildings
Streets & Roads	Commercial Buildings
Earthwork, Waterways	Industrial Buildings

Stages Reported

PROPOSED: (except Streets & Roads); BIDS ASKED (new announcements only. For full calendar, see also preceding issues of ENR); LOW BIDDERS ($500,000 projects and over); CONTRACTS AWARDED

Location of ENR Correspondents



Symbols and Abbreviations Include:

† Federal Government
★ Project of $500,000 or over
ENR Engineering News-Record
CD McGraw-Hill Construction Daily

WATER SUPPLY

PROPOSED WORK

Colo., Colorado Springs—30 in. pipe line from Manitou hydro-plant to Bell Crossing. $125,000.

Fla., Pahokee—R. S. Douthit, WW supt., exten. water supply line and relocating intake crib. Over $15,000.

Ga., Atlanta—W. Zode Smith, city mgr., new rein.-con. filter plant and accessories, Wiedeman & Singleton, Candler Bldg., engrs.

Idaho, Moscow—Watermains, elevated storage tank, installing pump. H. J. Smith, city engr.

Ill., Elgin—Filtration plant to serve Wing park swimming pool. $16,000.

Ill., Vermont—Bond election in spring, $250,000 waterworks and distr. sys.

Ind., Bloomington—Bd. P. Wks., Mayor L. Bruner, chn., City Hall, retained Greeley & Hansen, 6 N. Michigan St., Chicago, Ill., to survey WW situation and make recommendations regarding water supply increase methods. $50,000 available for drilling wells. CD 12/14—ENR 12/21.

Ind., Elwood—City, City Hall, 16 and Main Sts., rehabilitation and exten. mains in WW recently purchased from private interests. $20,000 or more.

Ky., Pine Bluff—Commonwealth of Kentucky, Dpt. Welfare, c/o M. Woll, comr. and R. C. Wyatt, engr., Frankfort, preliminary plans water plant for new women's detention house. $15,000. H. K. Bell, McClelland Bldg., Lexington, engr.

Mich., Portland — Extensive overhauling municipal dam, complete rebuilding apron structure and other extensive repairs on Grand River below here. $18,000.

†N. Y., Bath — Veterans Administration, Arlington Bldg., Wash., D. C., imprv. water sys. at Veterans Facility. $30,000.

N. Y., Binghamton—Enlarging source of water supply, drilling deep wells. Over $15,000. J. A. Giles, city engr.

N. Y., Yonkers—Extend. c.i. watermains. Over $25,000. C. Sheridan, comr. P. Wks. R. J. Whitney, city mgr.

N. C. Roxboro—J. C. Harris, city mgr., imprv. pumping service and filtration to increase water supply. W. M. Piatt, Durham, consult, engr.

O., Youngstown—Water and sewer lines to Comersburg, $100,000. R. W. O'Neill, city engr.

Pa., Elizabeth—Twp. Supervs., WW and distr. sys. $250,000. May mature as WPA.

Pa., Fleetwood — Boro Council, L. M. Scheiry, burgess, imprv. watershed, reservoir and source of water supply. $22,000. R. Schlegel, c/o owner, water comr.

Tex., Griffing Park (near Port Arthur)—H. G. Johnson, mayor, WW imprvs., watermains, fire hydrants, service pumps, 100,000 gal. steel tank, 75 ft. steel tower, ground storage reservoir, fire fighting equip. $45,000 or more. M. C. St. John, 4101 Polk St., Houston and engr. for town of Griffing Park. CD 10/13—ENR 10/19, under Port Arthur.

Tex., Huntington—J. F. Burris, mayor, WW sys. imprvs., 14,000 lin. ft. 2- to 4-in. c.i mains, fire hydrants, service pumps, 100,000 gal. concrete ground storage reservoir, treating plant, etc. $32,000. M. C. St. John, 4101 Polk St., Houston, engr. and engr. for town of Huntington.

Wis., Cottage Grove—Referendum vote about Feb. 20, water sys. $90,000. General Eng. Co., Portage, engr.

Wis., Durand—R. Hammond, city clk., surveys water treatment plant, $15,000 up (not official). Druar & Milinowski, 1411 Pioneer Bldg., St. Paul, Minn., engrs.

Wis., Sheboygan Falls—Referendum probably held in spring for constructing water softening plant, A. L. Leavens, clk. J. Donohue Eng. Co., Sheboygan, engrs.

B. C. Kamloops—Gore & Storie, engrs., 1130 Bay St., Toronto, Ont., recommended slow sand filtration plant 3 m. Imperial gals p.d. exten. intake and addns. to pump. equip. for Council. $87,800. Report to be considered.

BIDS ASKED

Bids Asked January 29

N. Y., New York—Comr. Water Supply, Gas & Electricity, Municipal Bldg., wood pile and concrete supports under existing steel watermain, Flushing Meadow Park, Queens Boro.

Bids Asked January 30

Ind., Huntington—Bd. P. Wks., F. E. Cutshall, chn., City Hall, water and power plant, Div. A, well development. Total est. $350,000. Lennox & Matthews, 823 Architects & Builders Bldg., Indianapolis, consult, engrs.

Bids Asked February 1

N. Y., Schoharie—Furnishing, erecting 500,000 gal. water tank. Over $15,000. W. B. Webster, Duanesburg, engr.

Bids Asked February 5

N. J., Spring Lake—Boro, M. O. Morris, clk., Washington Ave., deep well, appurtenances to be installed in WW yard; sealing up old wells in WW yard. E. H. Schmieder, 1109 3 Ave., engr.; adv. ENR 1/25. CD 11/30—ENR 12/7.

Wash., Vancouver—Drilling well in Park Hill cemetery. J. L. Henderson, City Hall, engr.

Bids Asked February 8

Kan., Nortonville—C. W. Moxley, city clk., WW sys. $36,500. E. T. Archer & Co., 609 New England Bldg., Kansas City, Mo. engrs. CD 1/12—ENR 1/18.

Bids Asked February 10

Ind., Chalmers—Town Bd., D. C. Wilson, chn., G. M. Little, clk., WW sys. M. L. Burden, 103½ N. Harrison St., Alexandria consult engr. CD 1/5—ENR 1/11.

Bids Asked February 13

Ia., Bedford—Imprv WW plant. Over $15,000. Stanley Eng. Co., Muscatine, engrs. H. E. Nelson, city clk.

Bids Asked February 15

Calif., Los Angeles—Metropolitan Water Dist., 306 W. 3 St., furnishing, installing 2 chlorinators and appurtenant equip. at water softening plant, Spec. 321. Over $1,000. F. E. Weymouth, 306 W. 3 St., engr.

Bids Asked February 21

†Ind., Tell City—U. S. Eng., P. O. Box 59, Louisville, Ky., two complete pump. plants, electric motors, pumps and appurtenant works, Perry Co., adv. ENR 1/25.

LOW BIDDERS

★**Ill., Chicago**—O. E. Hewitt, comr. P. Wks., Jan. 12 west substructure South Dist. filtration plant in vicinity 79 st., Lake Michigan, from Michael Pontarelli & Son, 4248 N. Kilpatrick Ave., $2,231,500. CD 1/2—ENR 1/4.

CONTRACTS AWARDED

Calif., San Francisco—P. Utilities Comn., City Hall, laying 5,425 lin. ft. 6 and 8 in. c.i. watermains for Federal Housing Administration sub-div. Potrero Heights, Spec. 323, to S. F. Water Dpt., 425 Mason St. $9,172. City furnishes pipe and fittings. Bids 1/3. CD 1/4.

Kan., Cullison—WW. **WPA.** $20,000.

Md., North East—WW, **WPA.** $74,000. J. B. McCrary Eng. Corp., 22 Marietta St., Bl., Atlanta, Ga., engrs.

Mich., Mt. Morris—Water softener and iron removal plant for water supply sys., to Refinite Co., 1023 Harney St., Omaha, Neb. $11,000. Francis Eng. Co., Eddy Bldg., Saginaw, engrs.

Mo., Unionville—Earth fill dam with concrete spillway for city water supply, **WPA.** $90,000. U. S. Engineers, 1201 Davidson Bldg., Kansas City, Mo., engrs.

Neb., Alma—W. B. Fowler, clk., WW sys. imprvs. **WPA.** $19,700.

Neb., Schuyler—WW imprvs. **WPA.** $63,486, G. F. McKenzie, clk.

N. J., Sea Isle—Watermain in Landis Ave. **WPA.** $15,671. CD 12/21—ENR 1/4.

N. J., Woodbury Heights—Water sys., various streets. **WPA.** $116,042. CD 11/29—ENR 12/7.

N. Y., Aurelius (mail Auburn)—Continuation of watermain project, furnishing installing c.i. mains, hydrants, valves along W. Genesee St., **WPA.** approx. $15,000. C. W. Post, Old P. O. Bldg., Albany, ch. engr. and deputy administrator. CD 7/12—ENR 7/20.

N. Y., Binghamton—4,900 ft. 12 in. c.i watermain from Chenango St. at Morgan St., 670 ft. 6 in. c.i. main Fellows Ave., 460 ft. Haskins Ave., 670 ft. Wagner St., 770 ft. Garden Ave., 280 ft. 8 in., Riverview Ave., WPA, under supervision W. B. Lounsberry, City Hall, WPA Projects Engr. $88,000. J. A. Giles, city engr. CD 1/16—ENR 1/18.

N. Y., Newark—6 in. watermains, installing valves, etc., in Grace Ave. and Lyon Rd. **WPA.** $15,000. C. Post, Old P. O. Bldg., Albany, ch. engr.

N. Y., Watertown—C.I. mains, service connections, hydrants, etc. in Moulton and Bridge Sts. **WPA.** $35,000. C. L. Post, Old P. O. Bldg., Albany, ch. engr.

O., Akron—Contr. 310, cement mortar lining 20,000 ft. 36 in. and 14,000 ft. 48 in. steel watermains, and incidental work, to T. A. Gillespie Co., East Paterson, N. J. $59,200. Est. $75,000. W. F. Peters, dir. Pub. Serv.

O., Cincinnati—Imprv. California WW pump. plant, installing pump. equip., to Worthington Pump & Mchry Co., 401 Worthington Ave., Harrison, N. J. $72,340. Est. $75,000. Bids 12/22. CD 12/15.

O., Malvern—WW imprvs., new well, pump. station, distr. lines. **WPA.** $26,000. B. W. Wilson, Malvern, engr. H. Hart, village clk.

O., Youngstown—Mahoning Valley Sanitary Dist., City Hall, riprapping shoreline Meander Reservoir to half erosion and washing banks, transplanting trees, clearing, grubbing, draining swampa, etc. **WPA.** $110,750. L. T. Fawcett, 3728 Hudson Dr., engr.

Pa., Ligonier—Boro Council, enlarging imprv. water reservoir. **WPA.** Over $18,000. Boro Eng. Dpt., Ligonier, engrs.

R. I., Providence—Bd. Contr. & Supply, J. F. Collins, mayor and chn., City Hall, Contr. 4A, weatherproofing, interior painting, and Contr. 4B, repairing water purification works, Scituate, to Pneumatic Concrete Corp., 348 Washington St., $4,193 and $3,994 respectively. **PWA.** Bids 1/8. CD 12/29—ENR 1/4.

S. D., Newell—2,700 ft. well, to C. C. Miller, Belle Fourche, $13,905. CD 11/15—ENR 11/23.

Tex., Cedar Hill—J. C. Potter, mayor, additional WW sys. **WPA.** $17,000. Total est. $47,000. CD 11/1—ENR 11/9, under CA.

Tex., Dallas—J. W. Ashton, city mgr., exten. watermains, **WPA.** $107,300. J. B. Winder, water engr.

Tex., Highlands—Harris Co. Water Control & Imprv Dist. 1, water sys. with well, pumps, elevated tanks and service mains, **WPA** $80,100.

Tex., Monahans—WW imprvs. trenching and backfill, new collecting lines for sewerage sys., etc., force account, $22,000. Bids asked on 200,000 gal rein.-con. reservoir and sewer pipe work. J. D. Fowler, Monahans, engr. CD 12/9—ENR 12/15.